INFORMATION PROCESSING APPARATUS INFORMATION PROCESSING METHOD AND STORAGE MEDIUM

BACKGROUND

[0001] Field

[0002] Aspects of the present invention generally relate to an information processing apparatus, an information processing method, and a storage medium.

[0003] Description of the Related Art

[0004] Mixed reality (MR) techniques and virtual space (virtual reality (VR)) techniques using a head mounted display (HMD) have heretofore been studied. A system using an MR technique or VR technique needs to execute a single task as well as have flexibility to switch a plurality of tasks. Switching of tasks involves switching of target applications. If the target applications need to be switched through operation of an input device such as a keyboard, it is difficult for a person experiencing an MR technique or VR technique to accurately operate the input device while wearing the HMD. The person thus has to dismount and re-mount the HMD when switching applications. However, dismounting and re-mounting the HMD while experiencing an MR system or VR system impairs the sense of immersion and lowers the efficiency of task execution.

[0005] Studies have recently been conducted on methods for switching target applications without a need for a user's instruction operation on an input device, whereby the user experiencing an MR system or VR system can switch the target applications while wearing the HMD. Examples of such methods include a method based on a virtual input system using a gesture recognition technique and a method based on an object recognition input system using a shape recognition technique such as a pattern matching technique. Japanese Patent Application Laid-Open No. 2009-217834 discusses a technique for recognizing a pattern of a two-dimensional code from a captured image of the two-dimensional code, and starting processing corresponding to the recognized pattern.

[0006] According to the technique discussed in Japanese Patent Application Laid-Open No. 2009-217834, if a two-dimensional code is accidentally captured in an image, applications are automatically switched based on the misrecognition that the user desires to switch tasks. In other words, there may arise an issue that applications can be switched at timing not intended by the user, and an issue that an application may fail to be appropriately switched to one desired by the user.

SUMMARY

[0007] Aspects of the present invention are directed to appropriately determining switching of tasks with the user wearing the HMD and without a switching instruction operation by the user.

[0008] According to an aspect of the present invention, an information processing apparatus includes a first identification unit configured to identify an input device to be used to execute a task, the input device lying in a field of view range of a user wearing a display device, a second identification unit configured to identify an operation medium with which the user operates the input device, the operation medium lying in the field of view range of the user, a determination unit configured to determine processing to be executed based on the identified input device and the identified operation medium, and a display control unit configured to cause the display device to display an image corresponding to the determined processing.

[0009] According to another aspect of the present invention, switching of tasks can be appropriately determined with the user wearing the HMD and without a switching instruction operation by the user.

[0010] Further features of aspects of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a diagram illustrating a configuration example of a mixed reality (MR) system according to a first exemplary embodiment.

[0012] FIG. 2 is a diagram illustrating a hardware configuration example of an information processing apparatus.

[0013] FIG. 3 is a functional block diagram illustrating a control unit of the information processing apparatus.

[0014] FIG. 4 illustrates an example of a condition setting table.

[0015] FIG. 5 is a flowchart illustrating an operation of the information processing apparatus.

[0016] FIG. 6 is a diagram illustrating an operation of the information processing apparatus.

[0017] FIG. 7 is a diagram illustrating a state in which a character input application is activated.

[0018] FIG. 8 is a diagram illustrating a state in which a computer graphics (CG) adjustment application is activated.

[0019] FIG. 9 is a diagram illustrating a configuration example of an MR system according to a second exemplary embodiment.

[0020] FIG. 10 is a diagram illustrating a configuration example of an MR system according to a third exemplary embodiment.

[0021] FIG. 11 illustrates an example of a condition setting table.

[0022] FIG. 12 is a functional block diagram illustrating an image processing unit of an information processing apparatus.

[0023] FIG. 13 illustrates an example of a condition setting table.

DESCRIPTION OF THE EMBODIMENTS

[0024] Exemplary embodiments of the present invention will be described in detail below with reference to the accompanying drawings.

[0025] The following exemplary embodiments are mere examples of the means for carrying out aspects of the present invention. Changes or modifications can be made as appropriate depending on a configuration and various conditions of an apparatus to which aspects of the present invention is applied. Aspects of the present invention are not limited to the following exemplary embodiments.

[0026] FIG. 1 is a diagram illustrating a configuration example of a mixed reality (MR) system 10 including an information processing apparatus 30 according to a first exemplary embodiment.

[0027] The MR system 10 includes a head mounted display (HMD) 20 and the information processing apparatus 30. The MR system 10 is a system using a technique of